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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,683	03/04/2002	Hiroaki Matsuda	220228US0	2827

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
RODEE, CHRISTOPHER D	
ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 05/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/086,683	MATSUDA ET AL.	
	Examiner	Art Unit	
	Christopher RoDee	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 13-20* is/are pending in the application.

4a) Of the above claim(s) *7 and 8* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9-11 and 13-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Claims 7 and 8 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected method and apparatus, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 29 September 2003.

Information Disclosure Statement

The IDS filed 13 December 2004 has been considered.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the instant claims have been amended to specify the silicone resin of the resin layer is a crosslinked silicone resin. Although the artisan would understand that this limitation is supported by the specification in the examples as well as pages 8 and 9 (note enclosed citation to *Chemmical Encyclopedia of Chemical Technology*, first paragraph under silicone resins where trifunctional and tetrafunctional reactants are discussed: compare with formulae in specification) the specification does not provide clear antecedent basis for "a crosslinked silicone resin". The specification must be amended to specify a crosslinked silicone resin at a suitable passage, such as page 18, line 32.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 4-6, 9, 10, 13, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda *et al.* in US Patent 6,534,232 or JP 2001-027829, each in view of Hamano *et al.* in US Patent 6,500,594, and further in view of WO00/52533 or Yuasa *et al.* in US Patent 6,579,653.

The instant claims have been amended to specify a crosslinked silicone resin as the resin layer for the carrier and that the core, which is covered by the resin layer, has a weight-average particle diameter of 48 to 50 μm.

Matsuda exemplifies a carrier in Preparation of Carrier A (col. 9, l. 23-67) having a magnetite core having an average particle diameter of 44 μm (col. 10, l. 4) and is coated with a crosslinked silicone resin (Silicone Resin S; see col. 11, l. 20). Matsuda discloses that the coated carrier core has a specific resistance of 3.98×10^{15} Ωcm (col. 9, l. 64). Matsuda teaches that the carrier should have a specific resistance of 10^{9} Ωcm to 10^{16} Ωcm (col. 4, l. 32-46). The carrier is combined with a toner to form a developer. Because the core is a magnetite and is the same composition as used in the instant specification it appears that the core inherently has the requisite magnetic moment. Carriers B and C also disclose carriers having the same magnetite core of 44 μm and the same crosslinked silicone resin. Resistivities fall within the scope of the instant claims.

As discussed in the prior Office actions, the JP '829 reference is derived from the same priority document and is considered to have an equivalent disclosure as Matsuda.

Matsuda and the alternative primary JP document do not disclose the carbon black particles of the instant claims and does not disclose the carrier core size range specified.

Hamano teaches that the conductivity (i.e., resistance) of a carrier can be controlled by the placement of carbon black particles in the surface resin layer. Carbon black is preferred because of production stability, cost, and electroconductivity. The average particle diameter of the carbon black should be 0.1 μm or less with a primary particle diameter of 0.05 μm or less (col. 16, l. 24-43). This will aid in obtaining a carrier with a conductivity (i.e., resistance) of from 10^9 Ωcm to 10^{14} Ωcm (col. 16, l. 5-8).

As noted above, Matsuda does not identically disclose a carrier having a core with a size of from 48 to 50 μm, but Yuasa discloses teaches that carrier core materials typically have sizes of from 30 to 60 μm to obtain carriers with a resistivity of from 10^6 Ωcm to 10^{14} Ωcm (col. 40, l. 1-60). Silicone resins are disclosed as common carrier coating resins and Yuasa discloses conductive particles as usefully included in the coating resins (col. 40, l. 4-11)

The WO document is the publication of the corresponding PCT application from which Yuasa was derived. This document is relied upon because it has an earlier publication date than the Yuaua US Patent, but is considered to have equivalent disclosure.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to place a conductive carbon black particle in the crosslinked silicone resin coating layer of Matsuda and/or the JP document because Matsuda and the JP document teach that the carrier should have a resistance of 10^9 Ωcm to 10^{16} Ωcm and Hamano teaches that carbon black having a diameter of 0.1 μm or less with a primary particle diameter of 0.05 μm or less will aid in producing a carrier with a resistance at selected values within this range. Further the artisan would have found it obvious to modify the carrier core size in Matsuda and/or the JP document to those sizes near that exemplified because Yuasa teaches that varying the sizes

will also aid in obtaining a resistivity of from 10^6 Ωcm to 10^{14} Ωcm. Given the wealth of knowledge in the applied art it is apparent that the presence of carbon black particles with specific sizes and carrier cores with specific diameters are result effecting for the resistance of the carrier, which the artisan would optimize to obtain a resistance within the scope of the primary references.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda *et al.* in US Patent 6,534,232 or JP 2001-027829, each in view of Hamano *et al.* in US Patent 6,500,594, and further in view of WO00/52533 or Yuasa *et al.* in US Patent 6,579,653 as applied to claims 1, 4-6, 9, 10, 13, and 17-20 above, and further in view of *Handbook of Imaging Systems*, to Diamond, pp. 222-224.

These references were discussed above. This rejection is set forth against claim 5 in the event the references do not disclose the magnetic moment of this claim. As noted above, the primary references disclose a magnetite core for the carrier.

Diamond teaches that magnetite carriers typically have a saturation magnetization of from 80 to 90 emu/g. The saturation magnetization would appear to be substantially the same as the claimed induced magnetic moment given the substantial force applied for the claim's measurement at 1 kÖe.

The artisan would have also found it obvious to produce the carrier of the primary references with the magnetization characteristics discussed by Diamond because this magnetization is disclosed as being within the area of current interest to the artisan for magnetites. The artisan would thus have found it obvious to use magnetization characteristics within the disclosure of Diamond in order to optimize the carrier's properties.

Claims 2, 3, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda *et al.* in US Patent 6,534,232 or JP 2001-027829, each in view of Hamano *et al.* in US Patent 6,500,594, and further in view of WO00/52533 or Yuasa *et al.* in US Patent 6,579,653 as applied to claims 1, 4-6, 9, 10, 13, and 17-20 above, and further in view of Shintani *et al.* in US Patent 5,204,204.

These references were discussed above. The references do not disclose the particle size distribution characteristics of the carrier of claims 2 and 3. However, Shintani teaches that it is advantageous to minimize the particle size distribution of resin coated carrier particles. Specifically, Shintani teaches carriers having average particle sizes of from 40 to 60 μm, less than 10 volume % of particles having a size below 31 μm, and a bulk density 2.45 to 2.65 g/cc (col. 3, l. 54-56; col. 6, l. 66 - col. 7, l. 2). These characteristics minimize the formation of aggregates having a size of 62 μm or greater (col. 7, l. 3-23) and reduce carrier fogging, adhesion of the carrier to the surface of the photoconductor, and character voids (col. 7, l. 3-7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to produce the carrier of the primary references with a narrow particle size distribution because Shintani states that narrow particle size distributions improve fogging characteristics, reduce carrier adhesion to the surface of the photoconductor, and reduce carrier voids. Specifically, Shintani teaches that less than 10 volume % of carrier particles having a size below 31 μm give the results describes. This clearly suggests that the number of particles smaller than 31 μm as well as smaller than the average size of 40 to 60 microns should be minimized.

Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda *et al.* in US Patent 6,534,232 or JP 2001-027829, each in view of Hamano *et al.* in US Patent

6,500,594, and further in view of WO00/52533 or Yuasa *et al.* in US Patent 6,579,653 as applied to claims 1, 4-6, 9, 10, 13, and 17-20 above, and further in view of *Handbook of Imaging Materials* to Diamond, pp. 162-170.

Matsuda and the JP reference were discussed above with respect to the base claims from which the above rejected claims depend. The reference does not disclose a magnetic toner and does not disclose the specific monomers of the thermoplastic resin. In the event the reference does not disclose a thermoplastic resin in claim 14 and the other toner features of the above rejected claims, the following reference is relied upon.

Diamond discloses that toner contains a binder resin that melts when heated, such as styrene copolymers of styrene acrylates, methacrylates, and butadienes (p. 165, bottom). The reference also discloses that colorants, charge control agents, magnetic particles, and release agents are typically added to toner formulations (see pp. 168-170). Magnetic particles in the toner reduce dirt in the machine environment.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a thermoplastic resin, such as a styrene acrylate, as the toner binder resin in the invention of Matsuda or the JP reference because Diamond teaches that these resins are commonly used in the art and are chosen for their fixing properties. The artisan would also have found it obvious to produce the toner of the JP document or Matsuda as a magnetic toner because Diamond teaches that magnetic additives are common in the art for toner in two-component developers because this gives better toner control in the machine environment.

Response to Arguments

The new grounds of rejection fully respond to the claims as currently amended. The evidence in the specification has been reviewed in light of applicant's remarks on pages 7 and 8 of the recent response. A review of the document shows that none of the examples reproduce the inventive carriers or developers of Matsuda. The closest prior art appears to be the inventive Carriers A, B, and C. None of the comparative examples appear to produce these carriers because the specific crosslinked silicones are different, as are the resistivities. The resisitivity of the carrier is seen as one of the key features of the invention as this aids on controlling the imaging characteristics obtained. Matsuda's carriers B and C produce carriers with resistivities within the scope of the claims and, as a result, appear particularly relevant. There is no evidence of record to indicate that carriers having the same crosslinked silicone resin layer and the same resistivity as claimed but a slightly different carrier core size and the presence of the specified carbon black in the resin layer gives an unexpected result. Because the comparative examples are not with the closest prior art and applicants have not provided an explanation of why the evidence provided is as close as or closer than the applied art, the rejection is seen as proper. See MPEP 716.02(e).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher RoDee whose telephone number is 571-272-1388. The examiner can normally be reached on most weekdays from 6:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cdr
3 May 2005

CHRISTOPHER RODEE
PRIMARY EXAMINER